

Only data not available in engineers' handbooks desired.

These data sheets are intended to be cut into four sections, 6 x 9 inches in size, as indicated by the straight lines. They may then be bound into note book form for convenient reference by means of staples inserted in holes punched at the points indicated. A suitable binder for these data sheets will be supplied for 25 cents. This binder has an open back and will hold an indefinite number of 6 x 9 sheets, depending on the length of staples used.

COMPARISONS OF MONEY STANDARDS.

Computed by Robert Grimshaw.

	Dollars.	Marks.	Florin.	Franc.	Shilling.
\$ 1.00.....	1.00	4.20	2.46	5.18	4.12
Mk. 1.00.....	0.238	1.00	0.586	1.23	0.979
Fl. 1.00.....	0.406	1.71	1.00	2.10	1.67
Fr. 1.00.....	0.193	0.81	0.475	1.00	0.794
Sh. 1.00.....	0.243	1.021	0.599	1.26	1.00
\$1.00 per pound Avoirdupois	= 9.24 Marks per kilogram. = 5.41 Florins per kilogram. = 11.40 Francs per kilogram. = 9s. 0d. 3 far. per kilogram.				
1 sh. per pound Avoirdupois	= 2.25 Marks per kilogram. = 1.32 Florins per kilogram. = 2.77 Francs per kilogram. = 0.535 Dollars per kilogram.				
\$1.00 per yard	= 4.59 Marks per meter. = 2.69 Florins per Meter. = 5.66 Francs per meter. = 4s. 6d. per meter.				
1 shilling per yard	= 1.11 Marks per meter. = 0.66 Florins per meter. = 1.38 Francs per meter. = 0.266 Dollars per meter.				
1 U. S. Gallon	= 3.79 liters = 0.833 British gallons.				
1 British Gallon	= 452 liters = 1.2 U. S. gal.				
1 Kilogram	= 2.2 pounds avoirdupois.				
1 Pound Avoirdupois	= 0.453 kilogram.				
1 German Centner	= 1.102 U. S. Cwt. = 0.9843 English Cwt.				
1 U. S. Cwt.	= 0.885 English Cwt. = 45.36 kilogram = 0.904 German Centner.				
1 English Cwt.	= 1.12 U. S. Cwt. = 50.8 kilogram = 1.016 German Centner.				
\$1.00 per U. S. Gallon	= 1.11 Marks per liter. = 0.65 Florins per liter. = 1.37 Francs per liter. = 1s. 1d. 1 far. per liter.				

1 shilling per British gallon	= 0.226 Marks per liter. = 0.133 Florins per liter. = 0.279 Francs per liter. = 0.054 Dollars per liter.		
\$1.00 per U. S. Cwt.	= 4.63 Marks per German Centner. = 2.71 Florins per German Centner. = 5.71 Francs per German Centner. = 4s. 6d. 2 far. per German Centner.		
1 shilling per English Cwt.	= 1.00 Marks per German Centner. = 0.59 Florins per German Centner. = 1.24 Francs per German Centner. = 0.24 Dollars per German Centner.		

ALLOYS OF GREAT STRENGTH.

Thurston's composition: copper 55, zinc 44.5, tin .5. Composition used by government for consols of guns: copper 57.5, zinc 42, tin .5. One per cent. tin may be used, but it reduces the elongation. H. E. Field in MACHINERY, February, 1904, says: To produce good results the zinc and copper must be pure. All except the finest quality of zinc contains lead, which reduces strength. The purity of copper can be determined by testing its electrical conductivity; if the conductivity is high the copper is pure. In melting and particularly in pouring use as low a heat as possible without producing blowholes. High heating is very detrimental. It is advantageous to add a small amount of aluminum to check oxidation. When all new metal is used, melt copper first, cool, and add tin and zinc; stir with a carbon stick and when at correct temperature for pouring add the aluminum and pour at once. If scrap is used, melt copper first, add the scrap to reduce the temperature, then add tin and zinc.

Supplement to MACHINERY, April, 1904.

LOGARITHMS OF CONVENIENT CONSTANTS.

Compiled by J. J. Clark.

	Logarithm	Reciprocal.	Logarithm
$\pi = 3.1416$.....	.4971509	.318309	1.5028491
$\frac{\pi}{4} = .7854$	1.8950909	1.273237	.1049091
$\pi^2 = 9.86965$.....	.9943018	.10132	1.0056982
$\sqrt{\pi} = 1.772457$.....	.2485755	.5641888	1.7514245
$\sqrt{\frac{1}{\pi}} = .564189$	1.7514245	1.772456	.2485755
$g = 32.16$	1.5073160	.0310945	2.4926840
$\frac{1}{2}g = 16.08$	1.2062860	.06218906	2.7937140
$2g = 64.32$	1.8083460	.01554727	2.1916540
$\sqrt{2g} = 8.019974$.....	.9041730	.1246887	1.0958270
1 cu. in. water weighs .03617 lbs.....	2.5583485	27.64723	1.4416515
Water column 1" x 1" x 1' weighs .43403 lbs.....	1.6375197	2.303988	.3624803
Water column 1" d x 1' weighs .34088 lbs.....	1.5326015	2.933584	.4673985
1 lb. water = column 1" x 1" x 2.304'.....	.3624825	.4340278	1.6375175
1 lb. water = column 1" d. x 2.9336'.....	.4674009	.340878	1.5325991
1 cu. ft. air at 32° F. and 30" Hg weighs .08073 lbs.....	2.9070350	12.387	1.0929650
1 gal. H ₂ O weighs 8.355 lbs.....	.9219465	.11969	1.0780535
1 cu. ft. H ₂ O contains 7.48 gal.....	.8739016	.13369	1.1260984
14.7.....	1.1673173	.06802721	2.8326827
1728.....	3.2375437	.0005787037	4.7624563
778.....	2.8909796	.001285347	3.1090204
144.....	2.1588625	.00694445	3.8416375
12.....	1.0791812	.0833333	2.9208188
33000.....	4.5185139	.0000303	5.4814861

COMPOSITION OF BRONZES (NAVY DEPARTMENT).

Contributed by F. W. Armes.

	Parts.
White Metal:	
Tin	7.6
Copper	2.3
Zinc	83.3
Antimony	3.8
Lead	3.0
Hard Bronze for Piston Rings:	
Tin	22.0
Copper	78.0
Bearings—Wearing Surfaces, etc.:	
Copper	6
Tin	1
Zinc	$\frac{1}{4}$
Naval Brass:	
Copper	62.0
Tin	1.0
Zinc	37.0
Brazing Metal:	
Copper	85.0
Zinc	15.0
Antifriction Metal:	
Copper—(best refined)	3.7
Banca tin	88.8
Regulus of antimony	7.5
Well fluxed with borax and rosin in mixing.	
Bearing Metal—(Pennsylvania Railroad):	
Copper	77.0
Tin	8.0
Lead	15.0

BEARING METAL.

In the Journal of the Franklin Institute G. H. Clamer states that 13 parts antimony and 87 parts lead make an excellent bearing metal, these being exactly the proportions which give a homogeneous structure. For heavier duty tin should be added.

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